CLOSURE

This utility model relates in general to closures for bottles, and more particularly to multi-purpose closures either with or without a check valve, used for bottling and storing in them expensive strong high-quality drinks and having means to indicate opening the bottle and to prevent unauthorised refilling.

Known closures can be divided into two types, i.e. closures including a check valve with a freely installed shutoff member to prevent refilling, and simplified closures without the aforesaid protection. The complicated closures with a check valves are usually used to protect strong high-quality drinks, vintage wines, etc., while the simple closures which have no protection from refilling can be used to close bottles for ordinary brands.

Generally, to fabricate both of the said types, it is necessary to use two separate production lines or else change forms to switch from one closure type to the other. Apart from using a large amount of equipment, such an approach will bring technological problems resulting even from minor modifications, e.g. the installation or removal of the valve.

It should be taken into account that in closures with a check valve, the check valve is traditionally fabricated as one piece with the closure body in order to reduce the number of the forms and minimise material consumption. (e.g. Russian patent 2161585, IPC B65D 41/38, published on January 10, 2001). Consequently, forms used for one closure type can not be used for the other type and vice versa.

Therefore, there is a need to develop a more versatile closure which can be easily modified without changing of forms or readjustment of the equipment.

Known is a protective closure for bottles with expensive liquids, including a discharge sleeve with coaxial outer and inner pipes at the inlet end, an inner hood having a pouring tube on its end and splines on its side surface, installed at the discharge sleeve by means of a thread to allow rotation and axial movement. The device includes also an outer hood with splines on its interior surface to interact with the symmetrically positioned splines of the inner hood, and a decorative casing with a tear member on its end (Russian patent 2180311, B65D 47/20, published on March 10, 2002).

This device does not provide protection from repeated unauthorised refilling and does not solve technological problems related to readjustment of the equipment for fabrication of such devices.

The aforesaid object is accomplished by the provision of the closure which can be fixed on the bottleneck and includes a discharge sleeve with an inner and an outer pipes on the inlet end, the discharge sleeve having a check valve with a fixing means on its exterior end surface to interact with a fixing means positioned symmetrically on the surface of the discharge sleeve. The aforesaid valve can be installed inside or outside of the inner pipe.

When the said check valve is installed inside the pipe, the fixing means includes a ridge or a groove. If the fixing means for the discharge sleeve is a groove, the fixing means for the check valve will be a ridge, and vice versa. When the check valve is installed in such a way, a sealing gasket will be installed between the outer and the inner pipes of the discharge sleeve.

When the said check valve is installed outside the pipe, the fixing means is made in the form of a flange located, in the assembled device, on the inlet end of the discharge sleeve between the outer and the inner pipes. In this case, at least one sealing collar is made on the exterior surface of the tubular body of the check valve, around its whole periphery.

The mating surfaces of the check valve and the discharge sleeve can be made conical in order to provide tight fixing with each other.

The aforesaid object is accomplished also by the fact that the outer hood has an inner fixing means on its end, interacting with the flange on the inlet end of the discharge sleeve. A decorative casing is installed on the outer hood in such a way that the decorative casing and the outer hood can not rotate around each other, and the decorative casing and the outer pipe can rotate around each other.

When the check valve is made separate from the discharge sleeve, and they can be fixed with each other, the object is accomplished of the universalization of closures and forms used for their fabrication.

The sealing gasket ensures a more reliable installation of the closure on the bottleneck and the sealing-in of the bottle.

The proposed utility models will now be explained by way of the non-limiting description of the preferred embodiments and with the reference to the accompanying drawings in which:

Figure 1 is a view of the section of the closure as an assembly with the check valve installed inside the inner tube;

Figure 2 is a schematic view of the apparatus with the check valve installed outside the inner pipe;

Figure 3 is a view of the section of the closure without the check valve;

Figure 4 is a schematic view of the partial section of the discharge sleeve and the inner hood.

In Fig. 1 is shown a closure 1 which can be set on the bottleneck (not shown in the Figure) by its lower part 2, including the discharge sleeve 3, on which the inner hood 5 with the pouring tube 6 and splines 7 on its exterior side surface is installed by means of thread 4 which allows its rotation. On the inlet end of the discharge sleeve 3, coaxial outer pipe 8 and inner pipe 9 are made. Inside the inner pipe 9, a check valve 10 is located with a freely installed shutoff member 11 (made as a ball in the shown embodiment).

In this embodiment, valve 10 has a very simple design and includes a tubular body 12, whose surface is congruous with at least a part of the surface of the discharge sleeve 3. The outer diameter of the valve 10 must match the inner diameter of the discharge sleeve 3 to ensure the valve to tightly fit to the discharge sleeve during installation of the valve into the pipe 9. Figure 1 illustrates the valve 10 and the discharge sleeve 3 which are cylindrical (tubular) in shape. It is clear to those skilled in the art that the conical shape of these parts is preferable, as it ensures a more tight fitting of the valve to the discharge sleeve (see Fig. 2).

The check valve 10 has in its lower part a narrowing end to freely hold the shutoff member 11 (valve ball), whose diameter is less than the inside diameter of the tubular body 12, but is more than the diameter of the flow area of the lower narrow end of the body. The upper part of the valve 10 has separate ridges 13 to interact with grooves 14 on the interior surface of the discharge sleeve 3 for mutual fixation of the valve and the discharge sleeve. Alternatively, ridges 13 and grooves 14 can change positions, i.e. ridges will be made on the interior surface of the discharge sleeve, and grooves will be made on the exterior surface of the valve. Here other fixing or latching means can be used, which are well known in the art.

Fig. 2 shows an alternative embodiment with the check valve 10 installed outside the inner pipe 9, the outlet end of the valve having a flange 15, and the matching surfaces 16 are conical in shape. This embodiment does not include the sealing gasket 17.

To provide greater tightness of the apparatus with the valve shown in Fig. 1, it has an additional gasket 17 installed between the pipes 8 and 9.

Outside the inner hood 5 and the discharge sleeve 3 is installed the outer hood 18 with splines 19 on its interior surface to interact with the splines 7 of the inner hood 5, with a hole 20 located above the pouring tube 6, with a decorative casing 21 tightly fitting to the

hood 18, the casing being made of, e.g. metal foil and having on its end a tear member 22, which is located above the hole 20 and attached to the decorative casing 21 by means of a thin strip 23 around its whole periphery.

The closure shown in Figure 3 can be made in two embodiments, either with or without the valve (the valve is not shown in this Figure). Such an apparatus is characterised in that the outer hood 18 on the end part has an inner fixing means 24 to interact with a flange 25 on the inlet end of the discharge sleeve 3, the decorative casing 21 is installed on the outer hood 18 in such a way that they can not rotate around each other, e.g. by means of gluing, and is installed relative to the outer pipe 8 in such a way that they can rotate around each other. If the apparatus is made without the valve, or with the valve installed inside the inner pipe, a sealing gasket 17 will be placed between the outer pipe 8 and the inner pipe 9.

The other parts of the shown closures are generally known, and though they have no immediate concern with the proposed improvements, they are briefly described below.

The first opening of the bottle results in breaking the tear member 22 due to the rise of the pouring tube 6 caused by the rotation of the inner hood 5 around the discharge sleeve 3. To improve tightness and ensure a more reliable sealing during the repeated closing of the bottle, the inner hood 5 has a cylindrical projection 26 ranging from the roof of the inner hood downwards, to several raking props 27. The aforesaid cylindrical projection forms, together with the interior surface of the inner hood, forms a seat for the gasket 28. The distance between the cylindrical projection 26 and the interior surface of the inner hood 5 is chosen in such a way that this annular space could accommodate the side wall of the discharge sleeve 3, which, naturally, is also annular in shape. Thus, the liquid content a closed (or re-closed) bottle is reliably secured from any evaporation.

The outer hood has in its lower section some members which are usually used to fix closures on the bottleneck collar, namely a flexible inclined shoulder 29 and stiffening ribs 30. There is also a plug 31 bearing on the raking props 27. The plug 31 is designed to shut off the flow area of the pouring tube 6 during re-closure of the bottle. More tightness is ensured by the sealing gaskets 17 and 28.

When the check valve 10 is installed outside the inner pipe 9, at least one sealing collar 32 is formed around the whole periphery of the exterior surface of the tubular body 12 of the check valve, and there is no need to use the sealing gasket 17.

After all the parts of the closure are fabricated, the apparatus will be assembled using simple and well known methods. For example, when an order to deliver closures with check valves is received, a lot of already fabricated closures without valves can be

quickly equipped with the necessary valves. First, a glass ball 11 is placed inside the tubular body 12 of the check valve 10, then the valve is moved, using some dynamic force and simultaneous reciprocate rotation, into or over the pipe 9. Afterwards, the sealing gasket 28 is placed in the aforesaid annular space between the cylindrical projection 26 and the interior surface of the inner hood 5, and the inner hood 5 is installed (screwed) on the male thread 4 of the discharge sleeve 3. Then the outer hood 18 is installed to interact by its splines 19 with the splines 7, the decorative casing 21 is set to tightly fix the outer hood 18, e.g. by gluing, the additional sealing gasket 17 is placed (if required), and the apparatus is pressed by hand on the bottleneck. In the process, the inclined shoulder 29 is forced to the pipe 8 and goes back after the passing of the bottleneck collar. Thus, the closure 1 is fixed on the bottleneck.

In some cases mentioned in the preamble of the description, the closure can be used without the check valve.

Those skilled in the art will understand that the described preferred embodiments allow various modifications and additions. For example, the outer hood and/or the decorative casing (metal jacket) can be knurled to facilitate gripping and rotating the apparatus. The lower part of the outer hood can have or have not longitudinal stiffening ribs, etc. It is understood that all the similar modifications of the closure are within the scope of the appended claims.